

Ashcroft Diaphragm Seal Assemblies and Compliance to ATEX 2014/34/EU

Ashcroft diaphragm seals do not contain any potential ignition sources as there are no heat sources of their own and no electrical components.

Therefore, they do not fall under the directive 2014/34/EU (ATEX). Taking into account the attached components, the diaphragm seal can be used in potentially explosive atmospheres.

PIP #: DS-PI-102

Applicable to:

Diaphragm Seal Assemblies

Structure and Function

1 Pressure gauge

Attached component / pressure indicator

2 Transmission fluid

The transmission fluid hydraulically transfers the medium pressure from the diaphragm to the measuring element of the pressure gauge.

3 Diaphragm seal

The *lower part of the diaphragm seal* is used to connect the diaphragm seal to a pipeline or container and comes into contact with the process medium. Depending on the installation situation, the connection is made via a thread, flange, clamp or welded connection. Optionally, the diaphragm seal lower part can be ordered with one or two flushing connections. This assembly is omitted in the case of flush diaphragm seals. The *upper part of the diaphragm seal* is used to connect the pressure gauge.

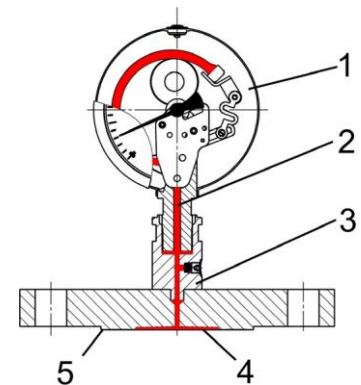
With flush diaphragm seals, the process connection is also made through the diaphragm seal upper part. The filling connection in the upper diaphragm seal part is closed pressure-tight by a ball in the conical seat, secured by a screw, or by a grooved pin.

4 Diaphragm

The diaphragm separates the process medium and the transmission fluid. When the pressure changes, the diaphragm is deflected by the shifting transmission fluid. The maximum displacement volume of the diaphragm seal and the pressure measuring instrument must be matched to each other. The diaphragm is made of metal foil (optionally coated with another material) and is welded to the upper part of the diaphragm seal.

5 Process connection

Process connection is defined by customer (selectable)



Functional description

A diaphragm seal is a device that is pre-assembled on the process side of a pressure measuring instrument in order to separate it from the gaseous and/or liquid process medium. All parts of the diaphragm seal that come into contact with the medium must be made of a material that is compatible with the medium.

The volume enclosed by the diaphragm, the diaphragm seal upper part, the optional available capillary or other accessory and the measuring element is completely filled with a pressure transmission fluid suitable for this application. A change in pressure on the process side causes a displacement of the filling liquid via the deflection of the diaphragm, which transmits the change in pressure to the measuring element of the pressure gauge.

Intended use

The devices are to be used exclusively for the purpose designated by the manufacturer. The devices serve to separate the pressure measuring device and the process medium. The corresponding installation regulations must be observed for each application. When used in potentially explosive atmospheres, the conditions of the attached components must be taken into account.

Responsibility of the operator

To ensure the safety of the installation, the operator is obliged to carry out an ignition hazard analysis. The responsibility for safe zoning lies with the plant operator and not with the manufacturer or supplier.

Diaphragm Information

The diaphragm that separates the medium from the measuring device is available in a wide variety of materials. In the case of coated, non-conductive diaphragms with an area > 80 cm², the thickness of the layer must not exceed 0.2 mm and potential equalization must be provided.

Loss of Fill Fluid

Leakage of the pressure transmission fluid in case of diaphragm damage. In this case, the system fluid can escape and come into contact with parts that are normally not in contact with the process medium. This has a direct impact on the function and safety of the system.

The operator must take the following risks into account in the ignition hazard analysis of the system:

- Chemical reactions - filling media of the diaphragm seal and possibly the filling media of the pressure gauge
- Mechanically generated sparks - Selection of suitable diaphragm seal materials and of the attached components
- Hot surfaces (temperatures of the process medium)
- Static electricity (electrostatic charge)
- Heat of compression due to rapid pressure changes (with gaseous pressure media)

General Information

The diaphragm seal assembly may only be installed, started up and operated by trained and qualified personnel familiar with the product. Qualified personnel are persons who, on the basis of their technical training, knowledge and experience as well as their knowledge of the relevant standards, are able to assess the work assigned to them and recognize possible dangers.

For installations in potentially explosive atmospheres, persons must have training or instruction or be authorized to work in potentially explosive atmospheres.